TURKISH JOURNAL OF EMERGENCY MEDICINE

Original Article

Access this article online

Quick Response Code:

Website: https://turkjemergmed.com/

DOI: 10.4103/tjem.tjem_167_25

Evaluation of the relationship between the hemoglobin, albumin, lymphocyte, platelet score, and clinical prognosis in patients with acute pancreatitis in the emergency department

Emine Sarcan[1]*, Ahmet Burak Erdem[1], Şeyda Gedikaslan[1], Ali Kablan[1], Yusuf Coşkun[2]

Departments of [1]Emergency Medicine and [2]Gastroenterology and Hepatology, Ministry of Health, Ankara Etlik City Hospital, Ankara, Türkiye
**Corresponding author*

Abstract:

OBJECTIVES: In acute pancreatitis (AP), the variable clinical course and high mortality have led to the use of complex and time-consuming scoring systems. This study aimed to evaluate the diagnostic performance of the hemoglobin, albumin, lymphocyte, and platelet (HALP) score in predicting mortality and intensive care unit (ICU) admission in patients with AP, and to compare it with the Atlanta classification and the Bedside Index for Severity in AP (BISAP).

METHODS: This single-center retrospective study included 455 patients diagnosed with AP. Demographic data, laboratory findings, and clinical course of the patients were recorded, and HALP, BISAP, and Atlanta classification scores were calculated.

RESULTS: The Atlanta classification showed the highest predictive accuracy for both mortality and ICU admission (mortality: sensitivity 91%, specificity 96%; ICU admission: sensitivity 77%, specificity 99%). The HALP score demonstrated a moderate predictive ability for both mortality (sensitivity = 0.64; specificity = 0.79) and ICU admission (sensitivity = 0.74; specificity = 0.67). The sensitivity of the HALP score was significantly higher than that of the BISAP score for both outcomes ($P < 0.001$).

CONCLUSION: Although the HALP score has a lower overall predictive power compared to the Atlanta and BISAP scores, its higher sensitivity and easily calculable structure compared to the BISAP score suggest that it may serve as a supportive tool for early prognostic assessment of AP patients in emergency department settings.

Keywords:

Emergency department, hemoglobin, albumin, lymphocyte, platelet score, intensive care unit, mortality

Submitted: 16-05-2025
Revised: 21-07-2025
Accepted: 22-07-2025
Published: 01-10-2025

ORCID:
ES: 0000-0002-5789-9622
ABE: 0000-0002-3618-6252
SG: 0000-0001-6420-6444
AK: 0009-0008-5355-5911
YC: 0000-0001-6016-6297

Address for correspondence:
Dr. Emine Sarcan, Department of Emergency Medicine, Ministry of Health, Ankara Etlik City Hospital, Ankara 06170, Turkey.
E-mail: dr.e.sarcan2010@gmail.com

Introduction

Acute pancreatitis (AP) is one of the most common causes of hospital admissions due to gastrointestinal diseases, with a global incidence ranging from 13 to 45 cases per 100,000 people annually.[1] AP presents with sudden-onset inflammation and varies in severity from mild forms to serious complications such as systemic inflammatory response syndrome (SIRS) and organ failure. Approximately 75%–80% of patients have a mild course and recover with supportive treatment, while in 20% of cases, the disease progresses to moderate

How to cite this article: Sarcan E, Erdem AB, Gedikaslan Ş, Kablan A, Coşkun Y. Evaluation of the relationship between the hemoglobin, albumin, lymphocyte, platelet score, and clinical prognosis in patients with acute pancreatitis in the emergency department. Turk J Emerg Med 2025;25:280-7.

Box-ED Section

What is already known on the study topic?

- Prognostic scoring systems such as the Bedside Index for Severity in Acute Pancreatitis (BISAP) and the revised Atlanta classification are commonly used, but they involve multiple parameters and can be time-consuming.
- The hemoglobin, albumin, lymphocyte, platelet (HALP) score is a recently introduced, easy-to-calculate index based on routine blood parameters, and has shown prognostic value in various inflammatory conditions.

What is the conflict on the issue? Does it have importance for readers?

- The role of the HALP score in predicting mortality and intensive care unit (ICU) admission in acute pancreatitis patients remains unclear.
- No prior studies have compared the prognostic accuracy of the HALP score directly with BISAP and Atlanta scores in the emergency department setting.

How is this study structured?

- This is a retrospective, single-center cohort study including 455 patients diagnosed with acute pancreatitis.

What does this study tell us?

- The HALP score showed a significant association with both mortality and ICU admission.
- While it had moderate predictive accuracy compared to established scores, it demonstrated higher sensitivity than BISAP.

or severe forms, leading to serious complications such as pancreatic or peripancreatic tissue necrosis and organ failure. In this patient group, the mortality rate ranges from 20% to 40%.[2] Therefore, early assessment of disease severity and appropriate treatment planning in AP patients are crucial for reducing mortality. The Atlanta classification was revised in 2012 with a greater emphasis on organ failure, categorizing AP into three severity levels: mild, moderate, and severe.[3]

Scoring systems are essential in evaluating the severity of AP. Commonly used tools include the Ranson criteria, Balthazar classification, acute physiology and chronic health evaluation II (APACHE-II), and the Bedside Index for Severity in AP (BISAP), which help predict disease severity.[4] However, these scoring systems face several limitations when used in the emergency department. Their low sensitivity and specificity, the complexity of scoring, and the fact that some scores are only suitable for assessing intensive care unit (ICU) patients make their integration into clinical practice challenging.[5] In addition, the requirement for at least 48 h of monitoring after admission to obtain a reliable score in some models poses a significant disadvantage for patient management in the emergency department, where rapid decision-making is essential.

The hemoglobin, albumin, lymphocyte, platelet (HALP) score was initially defined as a prognostic biomarker in oncologic patients, and a low HALP score has been shown to be associated with poor prognosis.[6] Hemoglobin and albumin levels are closely related to inflammation and nutritional status, while lymphocyte and platelet counts serve as indicators of immune response and coagulation processes. In recent years, the HALP score has therefore been utilized as a prognostic marker in a range of diseases, especially in conditions such as infections, sepsis, and inflammatory disorders.[7] However, the number of studies evaluating its prognostic value in patients with AP is limited.

This study aims to evaluate the association of the HALP score with mortality and disease prognosis in AP patients. In addition, it seeks to compare the HALP score with the BISAP scoring system in determining disease severity, using the Atlanta classification as a reference.

Methods

Study design and setting

This study was designed as a single-center, retrospective study conducted in the Emergency Department of Ankara Etlik City Hospital. Patients diagnosed with AP between January 1, 2024, and July 1, 2024, were included in the study. Patients aged 18 years and older who met at least two of the AP diagnostic criteria according to the 2012 Revised Atlanta Classification were included in the study. These criteria included typical abdominal pain, amylase or lipase levels exceeding three times the normal limit, and radiological findings specific to AP.[3] Patients under the age of 18 years, those diagnosed with malignancy, individuals with chronic renal or hepatic failure, those who had experienced major trauma or undergone surgical procedures within the past 3 months, patients with heart failure or chronic inflammatory diseases, those whose mortality status could not be tracked, pregnant patients, and those with missing data required for the calculation of HALP, BISAP, or Atlanta classification scores were excluded from the study. As a result, a total of 455 patients were included in the final analysis [Figure 1]. This study was conducted in accordance with the Declaration of Helsinki and the Strengthening the Reporting of Observational Studies in Epidemiology guidelines. Ethical approval was obtained from the Ankara Etlik City Hospital Ethics Committee (Approval No: AEŞH-BADEK-2024-1120, Date: November 27, 2024).

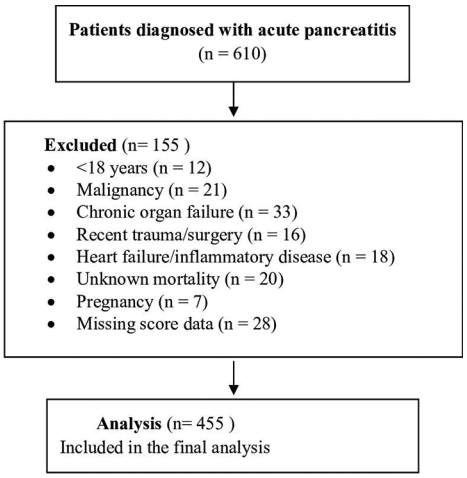

Figure 1: Flowchart of patient selection and inclusion in the study

Patient selection and data collection

All data of the patients included in the study were obtained from the hospital database and patient files. To determine the mortality status of the patients, hospital medical records and the national "Death Notification System" were used. The parameters evaluated in this study included patients' sociodemographic characteristics, vital signs, Glasgow Coma Scale (GCS) scores, complete blood count parameters (e.g., hemoglobin, lymphocyte count, and platelet count), biochemical parameters (including albumin, aspartate transaminase, alanine transaminase, urea, creatinine, amylase, lipase, sodium, and potassium), possible etiological factors, abdominal computed tomography (CT) findings, hospitalization status, 30-day mortality data, and the Atlanta classification, BISAP, and HALP scores.

Definition

According to the revised Atlanta classification, the severity of AP is categorized into three groups: mild, moderately severe, and severe AP.[3]

- Mild AP: Patients without organ failure or local and systemic complications were classified in this group
- Moderately severe AP: This group included patients with transient organ failure resolving within 48 h or those with local or systemic complications in the absence of persistent organ failure
- Severe AP: Patients with persistent organ failure lasting longer than 48 h were classified in this group.

The Atlanta classification was used to determine disease severity based on the clinical course and the presence of organ failure. The Atlanta score was evaluated retrospectively by an emergency medicine specialist based on clinical follow-up, radiological findings (CT imaging), and laboratory results documented in the hospital information system. Organ failure, according to the Atlanta definition, was defined as clinically significant dysfunction in one of the cardiovascular, renal, or respiratory systems. BISAP is a prognostic scoring system used to predict the severity of AP in the early phase. The five-point BISAP scoring system includes the following variables: blood urea >25 mg/dL, altered mental status, presence of SIRS, age >60 years, and presence of pleural effusion.[8]

There is no universally established reference range or cutoff value for the HALP score. In this study, its prognostic value was interpreted based on distributional characteristics within our cohort and previously reported associations in the literatüre. The HALP score was calculated using the following formula: hemoglobin (g/L) × albumin (g/L) × lymphocyte (/L)/ platelet (/L).[6]

Outcomes

The primary outcome of the study was to determine the accuracy of the HALP score in predicting ICU admission and 30-day mortality in AP patients. The secondary outcome was to analyze the effectiveness of the HALP score in predicting ICU admission and mortality by comparing it with the Atlanta classification and BISAP scoring system.

Statistical analysis

Data were analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). The normality of distribution was assessed using the Kolmogorov–Smirnov test. Descriptive statistics were presented as counts (*n*) and percentages for categorical variables, and as mean ± standard deviation for normally distributed continuous variables or median (minimum–maximum) for nonnormally distributed variables. For comparisons between two independent groups, the independent samples *t*-test was used for normally distributed variables, and the Mann–Whitney *U*-test was used for nonnormally distributed variables. The Chi-square test or Fisher's exact test was applied for categorical data, as appropriate. The diagnostic performance of the scoring systems in predicting mortality and ICU admission was evaluated using the area under the receiver operating characteristic (ROC) curve, also known as the area under the curve (AUC), and cutoff values were determined using the Youden index. Pairwise comparisons of AUC values were performed using the DeLong test with MedCalc version 23.2.1. $P < 0.05$ was considered statistically significant.

Results

Of the 610 patients initially evaluated for the study, 455 who met the inclusion criteria were enrolled in the final analysis. Their demographic characteristics, comorbidities, and vital signs were compared based on 30-day mortality. The median age of the patients was

61 years (range: 19–99), and 54.9% were female. The 30-day mortality rate was significantly higher among older patients ($P < 0.001$). GCS scores were significantly lower in nonsurvivors than in survivors ($P < 0.001$). Other parameters compared between the groups are summarized in Table 1.

Laboratory values that constitute the HALP score were significantly different between ICU-admitted versus non-ICU patients and survivors versus nonsurvivors. Hemoglobin and lymphocyte levels were significantly lower in ICU patients and nonsurvivors ($P < 0.001$ for both hemoglobin; $P < 0.001$ and $P = 0.006$ for lymphocytes, respectively). Albumin levels were also significantly lower in ICU-admitted patients ($P < 0.001$), while a nonsignificant trend was observed between survivors and nonsurvivors ($P = 0.06$). Platelet counts did not significantly differ between any of the groups ($P > 0.05$). The Atlanta classification and BISAP score were significantly higher among patients admitted to the ICU and those who died within 30 days ($P < 0.001$ for all comparisons). Similarly, HALP scores were significantly lower in both ICU and nonsurvivor groups ($P < 0.001$), reflecting its inverse relationship with disease severity [Table 2].

According to the ROC analysis, as shown in Table 3, the Atlanta classification demonstrated the highest diagnostic accuracy in predicting both mortality (AUC: 0.958) and ICU admission (AUC: 0.936). The BISAP score showed good performance in predicting mortality (AUC: 0.823) and ICU admission (AUC: 0.831), whereas the HALP score exhibited moderate predictive power for both outcomes (AUC: 0.743 for mortality; AUC: 0.739 for ICU admission).

The cutoff values for predicting mortality were determined as 3 for both the Atlanta classification and the BISAP score, and 0.44 for the HALP score. For ICU admission, the corresponding cut-off values were 3, 3, and 0.22, respectively. The Atlanta classification demonstrated high sensitivity and specificity for both mortality and ICU admission (sensitivity: 0.91 and 0.74; specificity: 0.96 and 0.99, respectively). In pairwise AUC comparisons conducted using the DeLong test, the Atlanta score was found to be statistically superior to both the BISAP and HALP scores in predicting mortality and ICU admission ($P < 0.001$). While the difference between the BISAP and HALP scores was statistically significant for ICU admission ($P = 0.0107$), no significant difference was observed in predicting mortality ($P = 0.1022$) [Table 3 and Figures 2 and 3].

Table 1: Demographic, clinical, and radiological features of survivors and nonsurvivors with acute pancreatitis

	Total (*n*=455), *n* (%)	Survived (*n*=410), *n* (%)	Nonsurvived (*n*=45), *n* (%)	*P*
Age (years)	61 (19–99)	60 (19–96)	72 (40–99)	<0.001
Female	250 (54.9)	225 (54.9)	25 (55.6)	0.931
GCS	15 (9–15)	15 (13–15)	14 (9–15)	<0.001
Hypertension	209 (45.9)	176 (42.9)	33 (73.3)	<0.001
DM	127 (27.9)	102 (24.9)	25 (55.6)	<0.001
CVE	11 (2.4)	7 (1.7)	4 (8.9)	0.016
Vital parameters, median (minimum–maximum)				
SBP (mmHg)	123 (70–200)	124 (70–200)	99 (70–172)	<0.001
DBP (mmHg)	75 (45–123)	76 (45–111)	62 (45–123)	<0.001
Heart rate (bpm)	85 (46–156)	85 (46–137)	90 (55–156)	0.007
SaO_2 (%)	96 (74–100)	96 (78–100)	89 (74–97)	<0.001
RR (breaths/min)	17 (12–34)	17 (12–26)	21 (14–34)	<0.001
BT (°C)	36.7 (35.6–39.2)	36.7 (36.0–39.2)	36.7 (35.6–38.8)	0.005
Etiology of pancreatitis				
Biliary	290 (63.7)	275 (67.1)	15 (33.3)	<0.001
Alcohol	27 (5.9)	26 (6.3)	1 (2.2)	
Hyperlipidemia	6 (1.3)	6 (1.5)	0	
Idiopathic	132 (29)	103 (25.1)	29 (64.4)	
Computed tomography findings				
Peripancreatic edema	211 (46.4)	195 (47.6)	16 (35.6)	0.125
Necrosis	38 (8.4)	18 (4.4)	20 (44.4)	<0.001
Fluid collection	81 (17.8)	66 (16.1)	15 (33.3)	0.004
Abscess	17 (3.7)	14 (3.4)	3 (6.7)	0.231
Pleural effusion	23 (5.1)	12 (2.9)	11 (24.4)	<0.001
Treatment location				
Discharged	31 (6.8)	31 (7.6)	0	<0.001
Ward	354 (77.8)	351 (85.6)	3 (6.7)	<0.001
ICU	70 (15.4)	28 (6.8)	42 (93.3)	<0.001

GCS: Glasgow Coma Scale, DM: Diabetes mellitus, CVE: Cerebrovascular event, SaO_2: Oxygen saturation, SBP: Systolic blood pressure, DBP: Diastolic BP, BT: Body temperature, RR: Respiratory rate, ICU: Intensive care unit

Table 2: Relationship between prognostic scores and hemoglobin, albumin, lymphocyte, platelet components with ıntensive care unit admission, and mortality in patients with acute pancreatitis

	Total (*n*=455)	No ICU admission (*n*=385)	ICU admission (*n*=70)	*P*	Survived (*n*=410)	Mortal (*n*=45)	*P*
HB[&] (g/dL)	13.4 (3.9–20.6)	13.5 (8.1–20.6)	12 (3.9–16.8)	<0.001	13.4 (8.1–20.6)	11.4 (3.9–16.2)	<0.001
LYM[&] (×10³/µL)	1.33 (0.11–7.41)	1.4 (0.22–6.05)	0.84 (0.11–7.41)	<0.001	1.355 (0.22–6.29)	0.94 (0.11–7.4)	0.006
Platelet[&] (×10³/µL)	267 (56–945)	270 (56–945)	263 (87–619)	0.460	267 (56–945)	272 (87–909)	0.968
Albumin[&] (g/L)	38.7 (18.1–56.8)	39.1±4.6	33.6±6	<0.001	38.9±4.7	32.4±5.9	0.06
Scoring systems, median (minimum–maximum)							
Atlanta score*	1 (1–3)	1 (1–3)	3 (1–3)	<0.001	1 (1–3)	3 (1–3)	<0.001
BISAP	2 (0–5)	1 (0–3)	3 (0–5)	<0.001	1 (0–5)	3 (1–5)	<0.001
HALP	0.27 (0.02–7.73)	0.28 (0.04–7.73)	0.13 (0.02–3.31)	<0.001	0.28 (0.04–7.73)	0.12 (0.02–3.31)	<0.001

*The Atlanta score was coded on a scale from 1–3, [&]HALP components. Representing mild (1), moderate (2), and severe (3) acute pancreatitis, respectively. ICU: Intensive care unit, HB: Hemoglobin, LYM: Lymphocyte, BISAP: Bedside index for severity in acute pancreatitis, HALP: Hemoglobin, albumin, lymphocyte, platelet score

Table 3: Receiver operating characteristic and DeLong analysis of Atlanta classification, bedside index for severity in acute pancreatitis, and hemoglobin, albumin, lymphocyte, and platelet scores in predicting mortality and intensive care unit admission

ROC analysis	Mortality			ICU admission		
	Atlanta	BISAP	HALP	Atlanta	BISAP	HALP
AUC	0.958	0.823	0.743	0.936	0.831	0.739
95% CI	0.926–0.990	0.761–0.885	0.657–0.829	0.899–0.974	0.777–0.884	0.672–0.806
Cutoff	3	3	0.44	3	3	0.22
Sensitivity	0.91	0.53	0.64	0.74	0.51	0.74
Specificity	0.96	0.91	0.79	0.99	0.94	0.67
P	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PPV (%)	71.9	39.3	25.2	92.9	61.0	29.1
NPV (%)	98.99	94.7	95.3	95.5	91.4	93.5
PLR	22.75	5.9	3.05	74.0	8.50	2.24
NLR	0.0937	0.5165	0.4557	0.2626	0.5213	0.3881
DeLong test	**Mortality**			**ICU admission**		
	Atlanta-BISAP	Atlanta-HALP	BISAP-HALP	Atlanta-BISAP	Atlanta-HALP	BISAP-HALP
SE	0.0337	0.0483	0.0490	0.0313	0.0376	0.0366
Z	3.998	4.446	1.634	3.397	5.317	2.553
P	0.0001	<0.0001	0.1022	0.0007	<0.0001	0.0107

ICU: Intensive care unit, ROC: Receiver operating characteristic, AUC: Area under the curve, CI: Confidence interval, BISAP: Bedside index for severity in acute pancreatitis, HALP: Hemoglobin, albumin, lymphocyte, platelet score, PPV: Positive predictive value, NPV: Negative predictive value, PLR: Positive likelihood ratio, NLR: Negative likelihood ratio, SE: Standard error

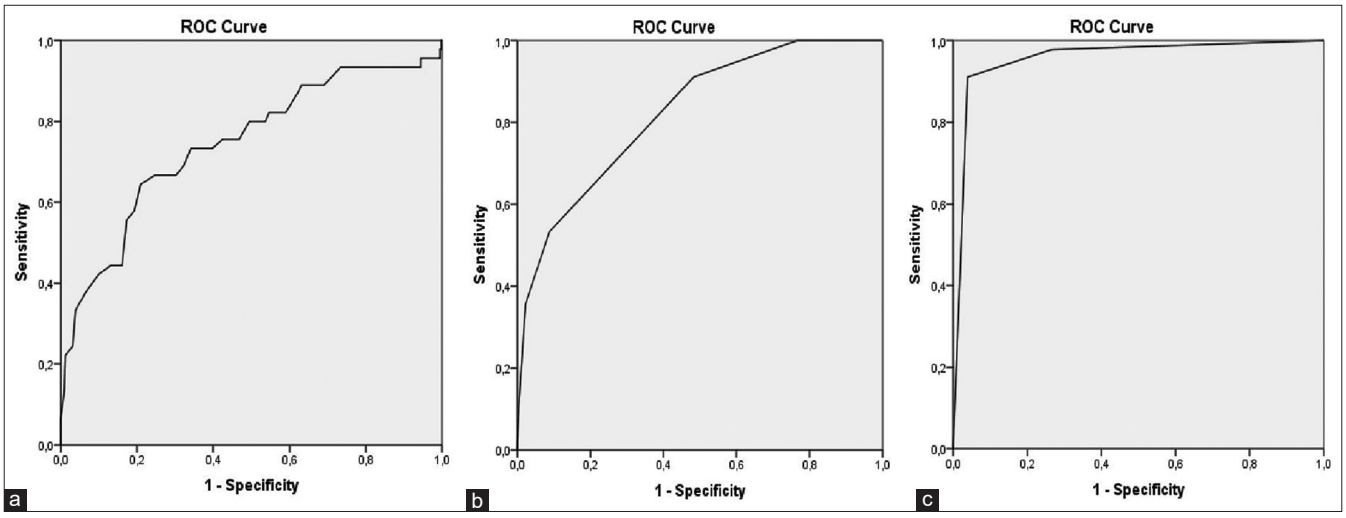

Figure 2: Receiver operating characteristic (ROC) curves of the Atlanta, bedside index for Severity in acute pancreatitis, and hemoglobin, albumin, lymphocyte, platelet scores in predicting mortality, (a) ROC curve for hemoglobin, albumin, lymphocyte, platelet Score, (b) ROC curve for bedside index for severity in acute pancreatitis score (c) ROC curve for Atlanta classification

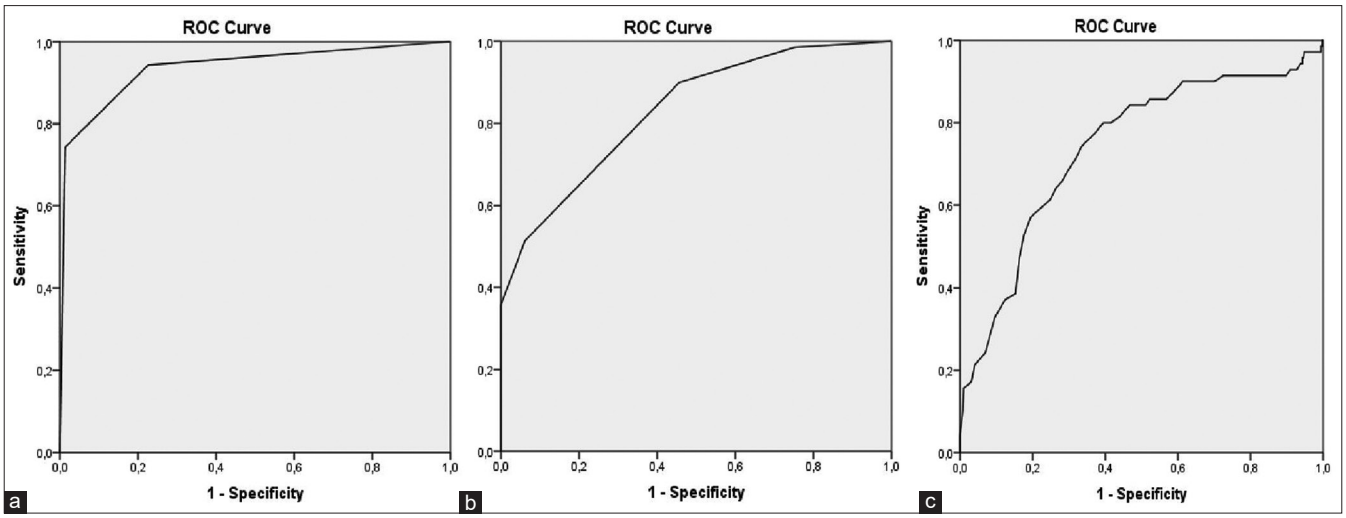

Figure 3: Receiver operating characteristic (ROC) curves of the Atlanta, bedside index for severity in acute pancreatitis (BISAP), and hemoglobin, albumin, lymphocyte, platelet scores in predicting intensive care unit admission, (a) ROC curve for hemoglobin, albumin, lymphocyte, platelet score, (b) ROC curve for BISAP score, (c) ROC curve for Atlanta classification

Discussion

This study demonstrated that both the Atlanta classification and the BISAP score were significant predictors of ICU admission and mortality in patients with AP. Furthermore, the HALP score was also found to be statistically significantly associated with both mortality and ICU admission.

In this study, the presence of hypotension, tachycardia, tachypnea, desaturation, and confusion was found to be significantly higher in patients with mortality. Similarly, decreased blood pressure and reduced oxygen saturation in AP have been reported to be associated with increased mortality risk and disease severity.[8] In addition, in this study, the presence of pancreatic necrosis and pleural effusion was found to be significantly more frequent in patients with mortality. Consistent with the literature, a study reported that the mortality rate in AP patients ranges between 1% and 7%, but this rate increases to approximately 20% in the presence of pancreatic necrosis.[9] A meta-analysis also revealed that pleural effusion increases mortality rates in patients with AP.[10] Considering the direct association of these parameters with disease severity and mortality, various scoring systems developed for AP also incorporate these variables. However, many scoring systems, such as Ranson, Sequential Organ Failure Assessment, and APACHE-II, may be insufficient in the early phase of AP due to their low predictive power, the requirement for numerous clinical parameters, and the fact that some are designed exclusively for ICU patients.[11] The BISAP score, which is widely used today, has a significant advantage in assessing AP severity as it requires fewer parameters and is easy to apply.[12] In this study, the BISAP score with a cut-off value of ≥3 was found to have a high predictive value for both mortality and ICU admission. Similarly, a systematic review by Zhu *et al.* demonstrated that the BISAP score with a cut-off value of ≥3 is effective in predicting mortality in AP patients.[11] Several studies in the literature have also shown that the BISAP score is effective in predicting ICU admission in patients with AP.[13] In our study, patients diagnosed with severe AP according to the Atlanta classification had significantly higher rates of both mortality and ICU admission. This finding supports the utility of the Atlanta classification as a powerful tool for predicting disease prognosis. Similarly, previous studies have reported that mortality rates among patients with severe AP range between 28% and 35%, and that a significant proportion of these patients require intensive care support.[14,15]

The requirement for multiple parameters and the time-consuming nature of current scoring systems complicate rapid decision-making in the emergency department. Therefore, there remains a need for simpler and more practical prognostic tools. In this study, we investigated the relationship between the HALP score and the prognosis of AP. Although direct evaluations of the HALP score in AP are limited in the literature, many studies have examined the associations between its individual components and AP. One of the key components of the HALP score, hemoglobin, is a critical parameter that determines the oxygen-carrying capacity of the blood. Anemia can impair oxygen delivery to tissues, leading to hypoxia, which may trigger an inflammatory response and increase disease severity.[16] In our study, hemoglobin levels were found to be significantly lower in patients admitted to the ICU and those with mortality. Similarly, in the literature, a study evaluating the relationship between anemia and disease

prognosis and severity in AP patients demonstrated that patients with anemia had a worse prognosis compared to those without anemia.[17]

Albumin is known as a negative acute-phase reactant, the levels of which decrease during inflammation. Low albumin levels may reflect the severity of disease as an indicator of systemic inflammatory response.[18] In our study, albumin levels were found to be significantly lower in patients who required ICU admission and in those who died. Similarly, in a study conducted by Ocskay *et al*., the presence of hypoalbuminemia in patients with AP was shown to increase the risk of mortality.[19] In our study, lymphocyte levels were found to be significantly lower in patients who required ICU admission and in those who died. Lymphocytes play a central role in the inflammatory response, and their levels may markedly decrease under systemic inflammation and physiological stress. Previous studies involving patients with AP have also indicated that a low lymphocyte count may reflect disease severity and could serve as an important marker for identifying severe cases of AP.[20,21] In our study, no significant difference in platelet levels was found between patients who required ICU admission or died and those in other groups. In the literature, thrombocytosis in patients with AP has been reported to increase the risk of local complications and may be associated with the development of severe disease.[22] However, the absence of such an association in our study may be attributed to differences in patient population, distribution of etiological factors, or individual variations in systemic inflammatory responses.

In this study, the HALP score was found to be significantly associated with both mortality and ICU admission in patients with AP. Similarly, a study conducted by Güler and Ustaalioğlu reported that the HALP score demonstrated high diagnostic accuracy in predicting short-term mortality.[4] In contrast, another study involving 191 patients found no statistically significant association between the HALP score and mortality; however, the score was significantly associated with prolonged hospital stay. This finding highlighted the potential of the HALP score to be more sensitive to indirect prognostic indicators such as length of hospital stay, due to its inclusion of parameters related to inflammation and nutritional status. Nevertheless, the limited sample size and the small number of deaths in that study reduced the reliability of its mortality analysis.[23] Moreover, these previous studies did not directly compare HALP score with traditional scoring systems and only assessed it in relation to mortality outcomes. In the present study, we compared the prognostic performance of the HALP score with the Atlanta classification and the BISAP score. For each score, AUC values were calculated using ROC analysis, and pairwise comparisons were performed using the DeLong test. The Atlanta classification demonstrated the highest AUC, sensitivity, and specificity values for both mortality and ICU admission. Although the BISAP score showed high specificity, its sensitivity was relatively lower. The HALP score demonstrated moderate prognostic accuracy; in particular, it showed a similar AUC value to the BISAP score for mortality and exhibited higher sensitivity.

Limitations

The single-center design of this study may limit the generalizability of the findings. Although patients with malignancy and chronic inflammatory diseases were excluded, the HALP score may still be affected by factors such as infection or hydration status. Despite these limitations, studies on the HALP score in AP are scarce. To the best of our knowledge, this is one of the first studies to compare the HALP score with both the Atlanta classification and the BISAP score, providing a novel contribution to the literature.

Conclusion

This study demonstrated that the HALP score is significantly associated with critical clinical outcomes, such as mortality and ICU admission, in patients with AP. Based on routine laboratory parameters and being easy to calculate, the HALP score may have potential utility in early prognostic assessment in emergency department settings. However, to increase its reliability for routine use in clinical decision-making, further large-scale, multicenter studies are warranted.

Author contributions

Concept – E.S., A.B.E.; Design – E.S., A.K.; Supervision – A.B.E., Y.Ç.; Fundings – E.S., Ş.G.; Materials – E.S., A.K., A.B.E.; Data Collection and/or Processing – E.S., A.K.; Analysis and/or Interpretation – Ş.G.; Literature Review – E.S., Ş.G., Y.Ç.; Writing Manuscript – E.S., A.B.E.; Critical Review – A.B.E., Y.Ç.

Conflicts of interest

There are no conflicts of interest.

Ethics approval

AEŞH-BADEK-2024-1120 Date: 27.11.2024 (Ethics Committee of the Ministry of Health Ankara Etlik City Hospital, Ankara, Turkey).

Funding

None.

References

1. Cunha EF, Rocha Mde S, Pereira FP, Blasbalg R, Baroni RH. Walled-off pancreatic necrosis and other current concepts in the radiological assessment of acute pancreatitis. Radiol Bras 2014;47:165-75.
2. Bang JY, Wilcox CM, Arnoletti JP, Varadarajulu S. Superiority of endoscopic interventions over minimally invasive surgery for infected necrotizing pancreatitis: Meta-analysis of randomized trials. Dig Endosc 2020;32:298-308.

3. Banks PA, Bollen TL, Dervenis C, Gooszen HG, Johnson CD, Sarr MG, *et al*. Classification of acute pancreatitis – 2012: Revision of the Atlanta classification and definitions by international consensus. Gut 2013;62:102-11.
4. Güler İ, Ustaalioğlu İ. Predictive power of HALP score in estimating short-term mortality in patients with acute pancreatitis. Ulus Travma Acil Cerrahi Derg 2023;29:1098-102.
5. Silva-Vaz P, Abrantes AM, Castelo-Branco M, Gouveia A, Botelho MF, Tralhão JG. Multifactorial scores and biomarkers of prognosis of acute pancreatitis: Applications to research and practice. Int J Mol Sci 2020;21:338.
6. Chen XL, Xue L, Wang W, Chen HN, Zhang WH, Liu K, *et al*. Prognostic significance of the combination of preoperative hemoglobin, albumin, lymphocyte and platelet in patients with gastric carcinoma: A retrospective cohort study. Oncotarget 2015;6:41370-82.
7. Tian M, Li Y, Wang X, Tian X, Pei LL, Wang X, *et al*. The Hemoglobin, Albumin, Lymphocyte, and Platelet (HALP) score is associated with poor outcome of acute ischemic stroke. Front Neurol 2020;11:610318.
8. Şefoğlu ÖF, Yaka E, Pekdemir M, Yılmaz S, Özturan İU, Doğan NÖ. Comparison of bedside index for severity in acute pancreatitis and emergency department SpO(2), age and systemic inflammatory response syndrome scores in predicting severe acute pancreatitis in patients with acute pancreatitis in the emergency department. J Emerg Med 2024;67:e10-21.
9. Goodchild G, Chouhan M, Johnson GJ. Practical guide to the management of acute pancreatitis. Frontline Gastroenterol 2019;10:292-9.
10. Zeng T, An J, Wu Y, Hu X, An N, Gao L, *et al*. Incidence and prognostic role of pleural effusion in patients with acute pancreatitis: A meta-analysis. Ann Med 2023;55:1-13.
11. Zhu J, Wu L, Wang Y, Fang M, Liu Q, Zhang X. Predictive value of the Ranson and BISAP scoring systems for the severity and prognosis of acute pancreatitis: A systematic review and meta-analysis. PLoS One 2024;19:e0302046.
12. Valverde-López F, Matas-Cobos AM, Alegría-Motte C, Jiménez-Rosales R, Úbeda-Muñoz M, Redondo-Cerezo E. BISAP, Ranson, lactate, and other biomarkers in prediction of severe acute pancreatitis in a European cohort. J Gastroenterol Hepatol 2017;32:1649-56.
13. Gao W, Yang HX, Ma CE. The value of BISAP score for predicting mortality and severity in acute pancreatitis: A systematic review and meta-analysis. PLoS One 2015;10:e0130412.
14. Nawaz H, Mounzer R, Yadav D, Yabes JG, Slivka A, Whitcomb DC, *et al*. Revised Atlanta and determinant-based classification: Application in a prospective cohort of acute pancreatitis patients. Am J Gastroenterol 2013;108:1911-7.
15. Zubia-Olaskoaga F, Maraví-Poma E, Urreta-Barallobre I, Ramírez-Puerta MR, Mourelo-Fariña M, Marcos-Neira MP, *et al*. Comparison between revised atlanta classification and determinant-based classification for acute pancreatitis in intensive care medicine. Why do not use a modified determinant-based classification? Crit Care Med 2016;44:910-7.
16. Wei Q, Yuan X, Xu Q, Li J, Chen L, Ying J. Correlation between hemoglobin levels and the prognosis of first-line chemotherapy in patients with advanced gastric cancer. Cancer Manag Res 2020;12:7009-19.
17. Cai YL, Wang SQ, Zhong HJ, He XX. The effect of anemia on the severity and prognosis of patients with acute pancreatitis: A single-center retrospective study. Medicine (Baltimore) 2022;101:e32501.
18. Rohat AK, Doğanay F, Yilmaz E. Comparison of C-reactive protein and C-reactive protein-to-albumin ratio in predicting mortality among geriatric coronavirus disease 2019 patients. Rev Assoc Med Bras (1992) 2022;68:82-6.
19. Ocskay K, Vinkó Z, Németh D, Szabó L, Bajor J, Gódi S, *et al*. Hypoalbuminemia affects one third of acute pancreatitis patients and is independently associated with severity and mortality. Sci Rep 2021;11:24158.
20. Yılmaz E, Rohat AK, Doğanay F. Usefulness of the neutrophil-to-lymphocyte ratio in predicting the severity of COVID-19 patients: A retrospective cohort study. Sao Paulo Med J 2022;140:81-6.
21. Qi X, Yang F, Huang H, Du Y, Chen Y, Wang M, *et al*. A reduced lymphocyte ratio as an early marker for predicting acute pancreatitis. Sci Rep. 2017;7:44087.
22. Chiba N, Sugita A, Mizuochi M, Sato J, Saito T, Sakurai A, *et al*. Clinical significance of reactive thrombocytosis in the course of acute pancreatitis. BMC Gastroenterol 2023;23:206.
23. Özkan A, Duman C, Özdemir S. The role of hemoglobin, albumin, lymphocyte, platelet (HALP) score in acute pancreatitis: An analytical study. Value Health Sci 2024;14:33-8.